REMARKS

Claims 1-12 and 30-40 are pending in this patent application. Reconsideration of the rejections in view of the remarks below is requested.

The Office Action rejects claim 40 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. In particular, the Office Action states that the broad recitation in claim 40 of "a conductive layer...not configured to be in contact with the object" conflicts with the narrow range/limitation of a "conductive layer on the surface in contact with the object" recited in the same claim 40 (via independent claim 1 from which claim 40 depends). Applicants respectfully disagree.

Applicants submit that claim 40 recites that claim 1 further comprises a conductive layer disposed on the side of the dielectric member facing the object but not configured to be in contact with the object. This is not the situation as posited in the Office Action where a broad limitation is recited in a dependent claim to modify a narrow limitation in the independent claim. Rather, this is a situation where at least two different conductive layers are recited – at least one on the surface of the pins configured to be in contact with the object and at least one other disposed on the side of the dielectric member facing the object but not configured to be in contact with the object. Applicants respectfully submit that this claim is definite to a person skilled in the art.

Therefore, for at least the above reasons, claim 40 is definite under 35 U.S.C. §112, second paragraph and Applicants respectfully submit that the rejection under 35 U.S.C. §112 should be withdrawn.

The Office Action rejects claims 1-12 and 40 under 35 U.S.C. §103(a) as being obvious in view of U.S. Patent No. 5,777,838 to Tamagawa et al. ("Tamagawa et al.") and U.S. Patent No. 6,754,062 to Logan et al. ("Logan et al."). Applicants respectfully traverse the rejection, without prejudice.

Paragraph 8 of the Office Action, in response to Applicants' Amendment of February 25, 2005, states that Logan et al. teach claim 1 by disclosing a side of the dielectric member (item 12 from Fig. 1A of Logan et al.) with a plurality of pins (item 14 from Fig. 1A of Logan et al.) having a conductive layer (item 18 of Fig. 1A of Logan et al.) on the surface in contact with the object (item 22 of Fig. 1A of Logan et al.). Further, paragraph 8 of the Office Action states that Logan et al. suggests using a conductive layer having a resistivity of about 10 to 1000 Ohm·cm. From these various teachings and suggestions, the Office Action

concludes that claim 1 is taught by Logan et al. in view of Tamagawa et al. Applicants respectfully disagree.

Applicants respectfully submit that paragraph 8 of the Office Action misapprehends the nature of items 14, 18 and 22 of Logan et al. Item 22 is the top working surface of a ceramic layer 20 fixedly deposited on the top of the electrostatic chuck of Logan et al. (See, Logan et al., col. 4, lines 26-44). Neither top working surface 22 nor ceramic layer 20 is an object to be held by electrostatic force (such as a wafer) as recited in Applicants' claim 1. Rather, it is top working surface 22 / ceramic layer 20 that is configured to hold an object by electrostatic force, rather than itself being held by electrostatic force. Indeed, if top working surface 22 / ceramic layer 20 were being held by electrostatic force, the chuck in Logan et al. likely would not work as probably no significant electrostatic force could be established between the electrostatic chuck 10 and a wafer (not shown in Figure 1A or 1B of Logan et al. but described in the specification – see, e.g., Logan et al., col. 2, lines 31-37).

Further, to the extent item 14 of Logan et al. are a plurality of pins comparable to those recited in Applicants' claim 1 and the conductive layer 18 of Logan et al. is disposed thereon, it is clear that the conductive layer 18 is not configured to be in contact with an object (such as a wafer) to be held by electrostatic force. Rather, conductive layer 18 is in contact with affixed ceramic layer 20 and the dielectric base 12.

Therefore, Applicants respectfully submit that Logan et al., as interpreted in paragraph 8 of the Office Action, fails to disclose, teach or suggest claim 1. Claims 2-12 and 30-40 depend from claim 1 and are, therefore, patentable for at least the same reasons provided above related to claim 1 and for the additional features recited therein.

Further, paragraph 5 of the Office Action reiterates the earlier arguments made in the Office Action dated August 27, 2004 that Tamagawa et al. teach claim 1 except for the conductive layer on the surface configured to be in contact with the object, the conductive layer having a specific resistivity less than 10 Ohm·m. Paragraph 5 of the Office Action asserts that such a conductive layer would be obvious from Logan et al. Applicants respectfully disagree.

Applicants submit that the rejection is improper by being based on an incorrect combination of differing, unrelated disclosures from the cited references, which disclosures as a whole would not lead a person skilled in the art to Applicants' claimed invention. In particular, Applicants submit that the teachings of Tamagawa et al. and/or Logan et al. fail to disclose, teach or suggest a chuck which, among other things, comprises a dielectric member facing an object provided with a plurality of pins having a conductive layer on the surface in

contact with the object, the conductive layer having a specific resistivity less than 10 Ohm·m, as recited in independent claim 1.

As the Office Action concedes and Applicants submit, Tamagawa et al. provides no disclosure, teaching or suggestion regarding a chuck comprising, among other things, a plurality of pins having a conductive layer on the surface in contact with the object, the conductive layer having a specific resistivity less than 10 Ohm·m.

To overcome this shortcoming in teaching, the Office Action relies on Logan et al. However, the only layer in Logan et al. configured to be in contact with an object (such as a wafer) to be held by electrostatic force is ceramic layer 20. As discussed below, Logan et al. does not disclose or suggest ceramic layer 20 as being a conductive layer having a specific resistivity less than 10 Ohm·m as claimed. Moreover, referencing completely unrelated low resistivity values for another electrical component in the electrostatic chuck of Logan et al. is unavailing.

Logan et al. refers to the ceramic layer 20 as being either a dielectric or a conductor depending on the clamping force required and indicates that the resistivity of the ceramic layer is on the order of about 10^9 to 10^{11} Ohm·cm or 10^7 to 10^9 Ohm·m, which allows a slow current leakage through the top working surface and greatly increases the holding power of the chuck through the Johnsen-Rahbek effect. (See, Logan et al., col. 3, lines 22-29). In other words, while the ceramic layer 20 may technically be conductive, it is very weakly so and is instead a high resistivity material. The resistivity of the ceramic layer disclosed by Logan et al. is nowhere near the 10 Ohm·m claimed in Applicants' claim 1. Indeed, a low resistivity for the ceramic layer in Logan et al. would be contrary to their teachings (and that of Tamagawa et al.) and wouldn't be useful in the design of Logan et al. as further discussed below.

Despite the teachings of Logan et al., the Office Action argues that it would nevertheless be obvious to use a conductive layer of less than 10 Ohm·m on the pins. In support of this position, the Office Action refers to the unrelated disclosure in Logan et al. of resistivity values of about 1 to 10 Ohm·m for the conductive layer 18 used to establish the electrostatic force of the chuck, a conductive layer not configured to be in contact with the object to be held on the electrostatic chuck. Applicants respectfully submit that the application of these resistivity values to a conductive configured to be in contact with an object to be held by electrostatic force thereon is akin to mixing apples and oranges.

The electrode used to generate the electrostatic force to hold an object, such as a wafer, on the chuck will necessarily have a low resistivity value but that does not make it

obvious to use such a material with a low resistivity value for a layer configured to be in contact with the object. Indeed, in the configuration of Logan et al., it would make little to no sense to use a low resistivity value for the ceramic layer 20. The ceramic layer 20 in Logan et al. extends substantially and uniformly across all of the electrostatic chuck. If the ceramic layer 20 had a low resistivity value, it would be unlikely that a significant electrostatic force would be able to hold an object, such as a wafer, onto the ceramic layer 20 and thus the electrostatic chuck.

Instead, like Tamagawa et al., Logan et al. teach selecting a material of high resistivity for the layer on the surface in contact with the object to greatly increase the holding power of the chuck through the Johnsen-Rahbek effect, in stark contrast to the teachings of Applicants' specification. For example, an advantage of an embodiment of Applicant's claimed invention is that "the direct connection between two conducting surfaces [the conducting surface on the object and the conducting surface on the pins] allows charge to flow freely and prevents the creation of Johnsen-Rahbek forces. Because the pins account for only a small proportion (0.5% to 4%) of the area of the dielectric member 12 the electrostatic force is reduced only by a small amount." (See, Applicants' specification, paragraph 47). "The Johnsen-Rahbek effect will still occur in the surface of the dielectric member 12 which does not have pins 16 present. However, the 5μm spacing between this surface and the top of the pins 16 ensures that Johnsen-Rahbek forces in this area are negligible." (See, Applicants' specification, paragraph 48).

In sum, neither the teachings of Tamagawa et al. nor of Logan et al. suggest putting a low resistivity layer in contact with the object and indeed specifically teach away therefrom as they seek to maximize the Johnsen-Rahbek force.

Therefore, for at least the above reasons, Logan et al. and/or Tamagawa et al. fail to disclose, teach or suggest all the features recited by claim 1. Claims 2-12 and 30-40 depend from claim 1 and are, therefore, patentable for at least the same reasons provided above related to claim 1 and for the additional features recited therein. As a result, Applicants respectfully submit that the rejection under 35 U.S.C. §103(a) should be withdrawn and the claims allowed.

All objection and/or rejections having been addressed, it is respectfully submitted that the present application is in condition for allowance. If questions relating to patentability remain, the Examiner is invited to contact the undersigned to discuss them.

Should any fees be due, please charge them to our deposit account no. 03-3975, under our order no. 081468/0305463. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced deposit account.

Respectfully submitted,
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